CLAIMS

1. A tamperproof screw comprising:

bit engaging grooves formed in a screw head of said screw,

inclined portions that have a specified angle of inclination and are formed toward a central portion of a neck portion of said screw from open end edge portions of said bit engaging grooves,

step portions that are respectively substantially perpendicular in cross section and are formed in intermediate point of said inclined portions, and

a substantially conical bottom surface formed in the central portion where said inclined portions meet; said tamperproof screw being characterized in that:

an inverted truncated cone shape hole portion that reaches said bottom surface is formed as a continuation, except for said step portions, of said inclined portions so that said open end edge portions of said bit engaging grooves take a maximum diameter of said inverted truncated cone shape hole portion.

2. A tamperproof screw comprising:

bit engaging grooves formed in a screw head of said screw,

inclined portions that have a specified angle of inclination and are formed toward a central portion of a neck portion of said screw from open end edge portions of said bit engaging grooves,

step portions that are respectively substantially perpendicular in cross section and are formed in intermediate point of said inclined portions, and

a substantially conical bottom surface formed in the central portion where said inclined portions meet; said tamperproof screw being characterized in that:

an inverted truncated cone shape hole portion that reaches said bottom surface is formed as a continuation, except for said step portions, of said inclined portions so that said open end edge portions of said bit engaging grooves take a maximum diameter of said inverted truncated cone shape hole portion, and

a projecting portion is formed so as to protrude from a central portion of said bottom surface to a position above said step portions of said bit engaging grooves.

3. The tamperproof screw according to Claim 1 or 2, characterized in that said inverted truncated cone shape hole portion and said inclined portions that reach said bottom surface from said open end edge portions of said bit engaging grooves have an angle of inclination of substantially 20 to 30° with respect to an axis of said screw.

4. The tamperproof screw according to any one of Claims 1 through 3, characterized in that said step portions that are formed in intermediate point of said inclined portions of said bit engaging grooves are respectively formed with wall portions that are recessed inward from a vertical plane over a predetermined depth.

5. The tamperproof screw according to Claim 4, characterized in that said wall portions that are formed in said step portions of said bit engaging grooves have a structure in which said wall portions are recessed in a shape of a substantially shallow V in cross section.

6. The tamperproof screw according to any one of Claims 1 through 5, characterized in that said bit engaging grooves are constructed as a three-way groove that branches in three directions from a central portion of the screw head.

7. The tamperproof screw according to any one of Claims 1 through 6, characterized in that said bit engaging grooves are formed as a substantially fan-shaped groove in which the groove width increases outward a radial direction from a central portion of said screw head and are constructed so that opening angles of facing side wall portions of respective adjacent grooves is an angle that is slightly more acute than a right angle.

8. The tamperproof screw according to any one of Claims 1 through 7, characterized in that said screw head is constructed so that said screw head has a pan shape or a dish shape.

9. A combination comprising:

a tamperproof screw which is comprised of:

bit engaging grooves formed in a screw head of said screw,

inclined portions that have a specified angle of inclination and are formed toward a central portion of a neck portion of said screw from an open end edge portions of said bit engaging grooves,

step portions that are respectively substantially perpendicular in cross section and are formed in intermediate point of said inclined portions, and

a substantially conical bottom surface formed in the central portion where said inclined portions meet; wherein said tamperproof screw is characterized in that:

an inverted truncated cone shape hole portion that reaches said bottom surface is formed as a continuation, except for said step portions, of said inclined portions so that said open end edge portions of said bit engaging grooves take a maximum diameter of said inverted truncated cone shape hole portion; and

a screwdriver bit characterized in that said screwdriver bit is comprised of:

vane portions having substantially perpendicular end edge portions that engage with said step portions formed in intermediate point of said inclined portions of said bit engaging grooves of said tamperproof screw, and

a protruding portion formed by extending tip ends of said respective vane portions so as to conform to a shape of said inverted truncated cone shape hole portion and said inclined portions that extend from said step portions toward said central portion of said neck portion of said screw.

10. A combination comprising:

a tamperproof screw that is comprised of:

bit engaging grooves formed in a screw head of said screw,

inclined portions that have a specified angle of inclination and are formed toward a central portion of a neck portion of said screw from open end edge portions of said bit engaging grooves,

step portions that are respectively substantially perpendicular in cross section and are formed in intermediate point of said inclined portions, and

a substantially conical bottom surface formed in the central portion where said inclined portions meet; said tamperproof screw being characterized in that:

an inverted truncated cone shape hole portion that reaches said bottom surface is formed as a continuation, except for said step portions, of said inclined portions so that said open end edge portions of said bit engaging grooves take a maximum diameter of said inverted truncated cone shape hole portion, and

a projecting portion is formed so as to protrude from a central portion of said bottom surface to a position above said step portions of said bit engaging grooves; and

a screwdriver bit characterized in that said screwdriver bit is comprised of:

vane portions having substantially perpendicular end edge portions that engage with said step portions formed in intermediate point of said inclined portions of said bit engaging grooves of said tamperproof screw,

a protruding portion formed by extending tip ends of said respective vane portions so as to conform to a shape of said inverted truncated cone shape hole portion and said inclined portions that extend from said step portions toward said central portion of said neck portion of said screw, and

a hollow space formed in a center of a tip end of said protruding portion so that said projecting portion is guided thereinto.

11. The combination of a tamperproof screw and screwdriver bit according to Claim 9 or 10, characterized in that said protruding portion on said bit tip end of said screwdriver bit is formed with an angle of inclination of substantially 20 to 30° with respect to an axis of said screwdriver bit.

12. A header punch for manufacturing the tamperproof screw of Claim 1, characterized in that said header punch is comprised of:

projecting portions which have substantially perpendicular end edge portions and form perpendicular or recessed wall portions and step portions in end edge portions of bit engaging grooves in a screw head, and

a conical projecting portion which forms an inverted truncated cone shape hole portion and inclined portions in a central portion of said bit engaging grooves and to form a substantially conical bottom surface.

13. A header punch for manufacturing the tamperproof screw of Claim 1, characterized in that said header punch is comprised of:

projecting portions which have substantially perpendicular end edge portions and form perpendicular or recessed wall portions and step portions in end edge portions of bit engaging grooves in a screw head,

a conical projecting portion which forms an inverted truncated cone shape hole portion and inclined portions in a central portion of said bit engaging grooves and to form a substantially conical bottom surface, and

a cavity portion which is formed in a center of a tip end of said conical projecting portion and forms a projecting portion.